[Release Date]

Dec 13, 2011

[Applicable Hardware]

All Thecus XXX series / 1U4600 / N0503 / N4200 series / N5500 / N7700 series / N8800 series IP Storage Server

[Software Upgrade/Downgrade Note]

1. We recommend backup the RAID data before firmware upgrade. There is potential risk of data loss when upgrade the NAS firmware and Thecus is not responsible for any data loss and recovery.
2. After firmware v5.02.01 installed, the new software doesn't allow users to downgrade to any firmware version below v5.02.01.
3. System Configuration Download/Upload does not support different software version. Reminder: After upgrade to latest firmware, download configuration and save separately.

[New Features/Changes]

1) Added NFS 4.0 support.
2) Added NFS Sync / Async option.
3) Added Module login function.
4) Upgraded the SAMBA to v3.5.8.
5) Added Fan control function for N4100Pro, the default setting is “full speed”.
6) Added user quota support with stackable function.
7) Added ACL backup/restore of root folders, please refer to User's manual v6.5 to see the details.
8) Added options for Samba / CIFS.
9) Added option “External IP” for NAT port forwarding of FTP function.
10) Added v1.x SSL certificate input of web service.
11) Added User and Group backup function.
12) Added network UPS support.
13) Added the NAS Stacking support with N12000/N16000 series.
14) Modified SNMP trap OID to 1.3.6.1.4.1.38243.
15) Improved AFP connections from 50 to 300 except N4100PRO due to memory size is too small.
16) Upgraded nfs-utils to v1.2.4.
17) Improved the performance of WebUI responding.
18) Added “read-only” function for public folder.
19) Added Intel PRO/1000 PT Quad Port Server Adapter (8086:10a4) support.

[Bug Fixes]

1) Improved the multi-lingual translation on WebUI.
2) Improved the online help of NFS service.
3) Displayed the status of Disk info from Warning/OK to Detected.
4) Improved the behavior of recycle bin, please refer to User's manual v6.5 to see the details.
5) Improved the display issue of FSCK function.
6) Changed "folder.db to a hidden file which generated by NAS after setup ACL on sub-folders. The "folder.db" files still can be seen via NFS/AFP/FTP, this is a limitation.
7) Improved some display issues on WebUI.

[Limitations]

1. There is a capacity limit for different file systems. It means, if more than four 2 TB HDD installed, you may have select suitable file system when creating a RAID volume.

File System	Capacity Limit
EXT3	8 TB
EXT4	16 TB
XFS	16 TB
ZFS	> 16 TB

2. N5500/N7700 series/N8800 series support up to three RAID volumes. For ZFS RAID volume, just one is allowed. In addition, Snapshot function is only available in ZFS RAID.
3. RAID volume encryption: AES 256 bits
   a. NAS admin has to insert an USB flash disk to save encryption key file on it.
   b. To encrypt an existing RAID is not possible. Please do it while creating a new RAID.
   c. NAS performance will drop significantly while using encrypted RAID.
   d. The USB flash disk (key file) should exist whenever the NAS reboots/boots up and doing RAID configuring.
   e. Encrypted RAID doesn't support on-line Expansion, just off-line Expansion is doable.
   f. Encrypted RAID doesn't support file system check.
   g. If the USB flash disk (key file) lost or key file modified, the RAID data will be INACCESSIBLE FOREVER and no way to recover it.
4. Once the RAID created, there will be about 5% data used by EXT3 file system. The capacity stores the journal and inodes; which are necessary to keep RAID data safer.
5. RAID rebuild : in case one HDD failed in RAID 1, 5, 6, and 10 configurations, please hot unplug failed one and hot plug in new one; then RAID rebuilding will automatically start.

If the replacement is done after NAS shutdown, administrator has to manually add spare in Admin Web GUI to start the RAID rebuilding.

6. RAID rebuild / migrate: 4K alignment HDD are not allowed to be added into a non 4K alignment RAID disk set. It means, mixing up 4K alignment HDD and non-4K HDD will bring the NAS troubles. The RAID will be unstable when doing so.
7. RAID Expansion: When changing the RAID 5 configuration from five smaller disks to five bigger disks, you have to change one disk at a time and then rebuild the RAID. Lastly, utilize the newly added capacity from Space Allocation page.
8. ZFS limitations:
    a. Share folders on ZFS RAID are only allowed to be access by Samba.
    b. ZFS does not support NFS
        . When share folders created on ZFS RAID, NFS button in admin Web UI will be grayed out. [Storage > Folder]
        . NFS clients could not showmount the share folders created on ZFS RAID.
    c. ZFS does not support AFP
        . Mac computers could not find the share folders created on ZFS RAID even if the AFP service had been enabled from the NAS. In case the NAS just has ZFS RAID, Mac computers will fail to connect to the NAS.
    d. ZFS does not support FTP
        . When FTP user login into the NAS, all folders created on ZFS RAID are invisible and inaccessible.
    e. ZFS does not support ACL folder when doing Nsync in FTP mode
        . When doing Nsync in “Legacy FTP Server” mode, the Nsync folder on Target NAS is inaccessible, so the Nsync task always fails.
    f. ZFS does not need file system check
9. XFS limitations:
    a. XFS file system does not support folder quota. Since firmware 5.00.04, XFS supports user quota.
    b. XFS file system is with 16 TB limit.
10. iSCSI Target: the maximum numbers of iSCSI target volumes depend on the physical memory size and also the CPU power of each Thecus NAS. So the following limit applies since FW 3.01.01. No matter one RAID or multiple RAID volumes exist in a NAS, the maximum limit will be the same.

Max. No of iSCSI Targets	Model Name
2	N4100PRO
5	N5200PRO, 1U4500, N0503, N4200
10	N5500, 1U4600
15	N7700, N7700Plus N8800, N8800Plus
25	N7700PRO, N7700SAS

	N8800PRO, N8800SAS N12000
50	N16000

a. For NAS admin without cluster based OS/applications to manage multiple initiators connected to the same iSCSI volume, we highly recommend every iSCSI volume is connected by single iSCSI initiator. However, in case NAS admin has cluster based OS/applications, up to 8 initiators is possible.

b. Uncontrolled concurrent access to the same iSCSI target volume may result data corruption or un-predicable results.

c. iSCSI target may be disconnected from initiator if other RAID settings on the same target NAS being altered.

d. Verified iSCSI initiators:

Windows: Microsoft initiator v2.0.4
StarPort initiator 3.5.2
MAC OS: globalSAN iSCSI initiator version 3.0 (1150)
Linux: open-iscsi 2.0-865

e. There is a system advanced option to choose 4K or 512 bytes block size for iSCSI volume, and the default is 4K bytes. 512 bytes block size may encounter 2TB volume capacity limitation on some initiators running 32bit OS. Nevertheless, 4K block size could slice the iSCSI volume over 2TB, but, there might be compatibility issue. For VMware, we recommend using 512 bytes block size.

11. iSCSI Target : the iSCSI Target Driver had been changed since firmware 5.00.04.

Firmware Version	iSCSI Target Driver
2.00.00 ~ 3.05.xx	IET
5.00.04 and above	SCST 2.0.0.1

Please notice the limitations of iSCSI initiators running in host platform; NAS admin may have to change the LUN ID to fit below conditions.

Host Platform	Allowed iSCSI LUN ID
Microsoft initiator in Windows XP	0 ~ 254
Microsoft initiator in Windows Vista / 7	0 ~ 7
VMware ESXi	0 ~ 254
Open iscsi (to stack two Thecus NAS)	0 ~ 1
MAC globalSAN	0
XenCenter	0 ~ 1

12. iSCSI Expansion : there are some limitations applied.

a. The maximum iSCSI volume would be 16TB, and the minimum expansion size is 1GB.

b. iSCSI service will be stopped till the expansion completes.

c. iSCSI expansion just handles the volume size. The partition(s) inside the volume won't be adjusted.

d. iSCSI expansion just support local RAID, does not support add-on RAID by iSCSI stackable.

13. Stackable function: Support of stackable function across Thecus N5500/N7700 series/N8800 series NASes.

a. The concurrent connection on target iSCSI volume of Thecus NAS will be limited to 1 if the initiator comes from other Thecus NASes.

b. The internal file system format of stackable target is ReiserFS, and the maximum capacity is 16 TB.

14. iSCSI Thin-Provisioning

a. The Thin-Provision capacity has to be determined first.

b. Up to five iSCSI Thin-Provision target can be created on the Thin-Provision capacity.

c. The total virtual size of iSCSI Thin-Provision targets could not exceed 16 TB in a RAID.

d. The virtual size should be larger than the real capacity and less than 16 TB.

e. When determine the virtual size, the minimum increase is 100GB.

f. When the total used capacity reaches 90% of real Thin-Provision capacity, NAS will send E-mail notifications out every 10 minutes until the capacity expanded. Also, system log will show capacity warning in admin web interface. The host server won't receive any notification before the iSCSI Thin-Provision target full.

15. iSCSI LUN ID in admin web interface

a. The iSCSI LUN ID is between 0 and 254.

b. Duplicate ID is not allowed excepting ID 0.

c. Mac computer just recognized the first iSCSI volume.

16. Active Directory Support behavior: before AD Sync is pressed, search criteria has to be a fully match string to user account. After AD Sync is pressed, search criteria can be only beginning part of the user account. Only 1000 search results will be displayed.

17. To enable ADS support for Small Business Server 2003, we recommend do not install ISA server. Otherwise, N5500/N7700 series/N8800 series may fail to join the AD.

18. User Quota: user quota has been added since firmware version 5.00.04.

a. Value "0" means "User Quota Disabled"

b. A quota setting will be applied across multiple RAID volumes. It means, if you set 10GB quota for user John, he will be having 10GB on every RAID. For a NAS with three RAID volumes, John will have 30GB quota in total.

c. "User Quota" is implemented in EXT3, EXT4, and XFS RAID; however, ZFS just has "Folder Quota" support.

d. When using "User Quota" in a Master and XFS RAID, disabling quota might not take effective until the NAS reboots.

e. When "User Quota" full, the user will have 10% tolerance within 7 days; thus he can do some data moving and deleting temporarily.

f. System log and Email Notification will remind the users whose "User Quota" reached the limit at 24:00 everyday.

g. The status of "User Quota" across multiple RAID will be displayed on [User and Group Authentication > Quota > Quota Setting] page.

h. It may take long time to enable the "User Quota" the 1st time.

i. "User Quota" is calculated by UID in the NAS.

j. When users put data into a public folder, the used capacity will not be added to quota calculation. Also, data copied through WebDisk will not be calculated either.

19. Target USB function: the maximum capacity of Target USB is limited at 2TB. Just N5500 features target USB function; N7700 series/N8800 series doesn't have it.
20. Supports the following USB wireless dongles only. And it has to be installed before NAS booting up, no PnP. However, USB wireless dongles are no longer supported since firmware version 5.00.04.

[ZyDAS ZD1211]

a. 3Com 3CRUSB10075 (Manufacture ID: 6891, Device ID: A727)

b. Zyxel G220USB (Manufacture ID: 0586, Device ID: 3401)

c. PCI GW-US54mini (Manufacture ID: 14EA, Device ID: AB13)

[ZyDAS ZD1211B]

d. Zyxel ZyAIR G-220 V2 (Manufacture ID: 0586, Device ID: 340F)

21. Some attributes may not be included with files and folders when copying to a USB drive with FAT32 format.
22. If a USB hard drive is connected to NAS formatted as FAT16/32, the following restrictions apply:
    - Copy file with size greater than or equal to 2 GB to the NAS can not be performed due to FAT file system limitation.
    - Files created by Mac OS X like DS_Store can not be copied to the FAT16/32 USB drive.
23. NFS share is limited to public folders. In case you enable an NFS share on non-public (ACL) folder, the NFS client could successfully mount it but won't be able to read/write files. Currently we implemented NFS V3.
24. Reset button: N7700 series/N8800 series doesn't have a reset button like what N5200/N5500 has. So, in case the admin password or HTTP port lost, use LCM bottoms to load factory default please. In that case, user accounts and groups will be erased, but RAID data won't be affected.
25. HTTP and HTTPS ports should follow the rules given below.
    - Larger than 1024
    - Could not use 3169

- Port 80 (HTTP) and 443 (HTTPS) are allowed

26. Mac OS Limitations
    a. When using Mac OS X (post 10.2 with AppleTalk) without SMB, do not use Japanese characters in folder or file names to prevent errors accessing the data over a network.
    b. Mac OS 9 and Mac OS X can not see files on the network with names made up of over 32 characters.
    c. Mac OS 8.x/9.x only supports local character encoding on file names (without Unicode support).
    d. Occasionally, when a file is accessed by a Mac OS computer within a shared folder, an information file will be created in the same folder. If the file is then deleted by a Windows OS computer, the original file may no longer be accessible by Mac OS computers.
    e. The following characters are not allowed to be included in the name used for a file or shared folder when using Mac OS (AppleTalk) devices.
        ? [ ] / \ = + < > ; : ” , | *
    f. Writing a file larger than 2 GB is not allowed by MAC OS-9.
    g.When using AFP or Samba to access NAS, please disable “Hide Temporary Files” option under Samba/CIFS.
    h.Hidden “_NAS_Piczza_” folder in AFP.
27. NAS needs about 5 minutes to broadcast/register itself to other Mac OS through AppleTalk after booting up and service enabled.
28. While upgrade firmware version, note the special relation between add-on modules and firmware kernel/UI architecture.

Firmware Version	Kernel Version	Module Dependency
1.00.00 ~ 2.00.xx	2.6.13	V
3.00.06 ~ 3.05.xx	2.6.23	V
5.00.00 and above	2.6.33.7	V

    a. Many application modules are kernel dependant; so, for firmware V5, you may need new modules.
    b. Automatically disable all installed modules while NAS firmware upgrading from 3.xx.xx to 5.00.00.12 or above. Old and not working modules will have an exclamation mark "!" for reminder.
29. WebDisk : Only UTF-8 file name is supported.
30. File size has to be less than 1GB to be uploaded to Thecus NAS from web browsers. FTP software has no such limitation.
31. File names and folder names should not contain more than 250 characters in their entire directory path to prevent errors occur in the file copy operations.
32. The following characters are not allowed to be included in the name used for files or folders on Thecus NAS.

/ \ : * ? ” < > | [ ] = + ; ,

33. File and directory attributes can not be modified by an FTP client when the FTP server of Thecus NAS is enabled.
34. Anonymous FTP user could upload files into public folders but could not delete them.
35. FTP client can list up to 2000 files in a single folder.
36. Thecus NAS could work as a TFTP server since firmware 3.04.00.3.
    a. TFTP service folder should be public and without any ACL rule.
    b. Double byte file name (Chinese, Japanese, Korean, etc) may have problems in case the TFTP client doesn't support UTF8. Anyway we recommend using single byte characters as the file name.
    c. TFTP service runs at port 69 by default. It is changeable from admin web interface. Please notify possible port conflicts, if any.
    d. The biggest file size is 4GB while transferring thru TFTP.
37. N7700Plus / N7700PRO/N8800Plus/N8800PRO support specific GbE and 10 GbE NIC cards. There will be Additional LAN 1, 2, 3, and 4 to configure the network setting in admin web interface. However, the Link Aggregation functions will just work on original two on-board NIC, WAN/LAN1 and LAN/LAN2.
38. File system check page is in English, no multilingual.
39. Disk Power Management : some HDD may not respond to “idle spin down” command, and they won’t get into stand by mode even if the specified idle time had been reached. In addition, N7700SAS and N8800SAS do not support SAS HDD spin down at current moment.
40. Disk S.M.A.R.T. Test : N7700SAS and N8800SAS do not support Disk S.M.A.R.T. Test on SAS HDD.
41. UPnP function only works on WAN interface.
42. The create date is the same with modify date for every file copied into the NAS.
43. Single file size upper limitation: 2TB for EXT3 file system.
44. Thecus NAS uses the following service ports by default.

Services	Default TCP port
iTunes	3689
iSCSI	3260
Media	8080
Twonky (UI)	9000/9001
Nfsd	111/2049
Nsync	2000
Rsync	873
Printer Server	631
Mysql	3306
mail server	995/25

Upnp	2689
DLM2 (bt)	10000~10200
DLM2 (amule)	4662
DHCP	67/68
SNMP	161/162
FTP	20/21
Apache module	10080
Samba	139/445
SSH	22
HTTP	80
HTTPS	443

Services	**Default UDP port**
iTunes	5353
Nfsd	111/2049
Printer Server	631
Mysql	3306
Twonky	1900/1030
Upnp	1900
Samba	138/137
NTP	123
Udpr	11000/11001
DHCP	67/68
SNMP	161/162
DLM2	4672
Syslog	514
TFTP	69
FTP	20/21

45. While the log folder for rsync is not exist, the log event will write to “nsync” folder.
46. Since FW v5.02.01, the folder.db is a hidden file with SMB/CIFS, but it still can be seen via NFS/AFP/FTP.
47. Currently there are 2 USB UPS as following will be removed from List of WebUI at FW v5.03.xx, because they are not working properly.
    Powerware PW3105/PW5110
    Upsonic PrOffice 650 UPS
    Socomec NETYS PE 600VA UPS

[Known Problems]

1. Using samba protocol in MAC OS will not accept file names with blank characters in tail.
2. AD users cannot access file via AFP on MAC OS.
3. IE7 / IE8 will show certification error alert while user access WEB admin UI via HTTPS.
4. DOM backup won't work while there is only single DOM on the NAS.

[Attention]

1. **During firmware upgrade process, it is imperative that user DO NOT turn off the power to Thecus NAS or closes the browser window. This will lead to catastrophic result. If your browser is set to cache the screen, after firmware upgrade has started for 5 minutes, please press CTRL-F5 to reload browser screen from server instead of from browser cache.**
2. **Thecus strongly recommends NAS admin to backup the RAID data before doing the RAID Migration and Expansion. There is potential risk of permanent data loss when doing Migration/Expansion with disk drives having physical problems, and Thecus is not responsible for any data loss and recovery expense.**
3. When installing the Windows Wizard program of Thecus NAS on Windows XP Professional SP1 or SP2, Windows Vista, and newer OS, the firewall UDP ports 10000 and 10001 need to be opened.
4. Reset to factory default function automatically resets all the system settings including network settings, administrator password, user groups, language setting, system notification setting, and time zone setting.